Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

these kings is shown to be consistent with the data derived from the canon of Ptolemy; and a comparative view of Assyrian, Babylonian, Jewish, and Egyptian reigns concludes the paper.

Mr. William K. Sullivan read, by permission of the Academy, the following notice on the Chemical History of Pollen of Plants.

" The object of the present memoir is merely to bring before the notice of the Academy a few of the results at which I have arrived in the course of a long series of researches on the chemical nature of the pollen of plants. I hope to have the honour of laying before the Academy, at its next meeting in November, a detailed account of all the results which I have obtained.

" Hitherto I have examined the subject only in two points of view, viz., the proximate analysis, and the action of nitric acid on pollenin.

" If pollen be treated with ether until nothing further is dissolved, and if the ether be distilled off, an oil is obtained having all the properties of an acid. In all the pollens which I have examined I have found this to be the case; in no instance could I detect the presence of glycerine. This is the only case with which I am acquanted, in the whole vegetable kingdom, of the existence of a free oily acid. The presence of this oily acid in pollens has evidently an intimate connexion with the office which they perform in vegetation. Fritsche,* in speaking of the question as to whether the pollen-sac contains granules of different chemical compositions, and which of these granules is necessary to the function of fructification, says, that from his experiments he can only draw the probably erroneous conclusion that the oil-globules exist in every pollen, and that they are necessary for fructification, while the other kinds of granules occur very seldom, and are probably only intended to supply material for the formation of the pollenic tubes. This opinion, which is borne out by the researches of most others, coincides singularly with the anomalous chemical nature of the oil-globule itself. If the oil be saponified by carbonate of soda, from which it readily expels the carbonic acid, and precipitated by acetate of lead, and the lead salt treated with pure anhydrous ether, the greater part will dissolve, leaving a quantity of a lead salt, which, on decomposition with hydrochloric acid, yields a solid, white, fat acid, having all the properties of the acid obtained by the saponification of pure bee's wax. At present I prefer not giving any formula for this body. The portion soluble in ether, when decomposed, yields an oil which appears in every respect to be oleic acid. The quantity of the wax varies in different pollens, and it even appears to vary in different specimens of the same pollen. The pollen which I in general employed was that of the *Pinus picea*, but I have also examined that of *Pinus sylvestris*, *Abies excelsa*, *Ulex europeus*, *Sarothamnius scoparius*, and another species, *Crataegus monogyna*, *Sambicus nigra*, *Ilex aquifolium*, *Ranunculus hederaceus*, *β grandiflorus*, and also the sporules of *Lycopodium clavatum*.

---

* *Ueber den Pollen*, Petersburgh, 1837, p. 33.

"I have not been able to determine whether the stigma of plants is alkaline. I at first believed that such might be the case, and that some connexion existed between the acid nature of the pollen and the alkaline nature, if such be so, of the stigma; but the results at which I have arrived, with reference to the constitution of the pollenine itself, and particularly with reference to the chemical nature of the sporules of lycopodium, lead me to think that the origin of the oil-globules is simply a chemical metamorphosis of the pollenine, as I will point out in another place.

"The residue, after treatment with ether, was boiled for some minutes with a weak solution of potash, and then with pure water. The mass which remained after this treatment consists of the pollenine of Bucholz and John,* and is variable in quantity for each plant. From the pollen of *Pinus picea* I obtained about 80 per cent. Herepath obtained from

Lilium bulbiferum, ...	43·012
——— candidum, ...	36·936
Cactus speciosissimus, ...	46·575†

" The pollenine obtained from *Pinus picea* scarcely differs in appearance from the original pollen ; it is insoluble in every substance which I have hitherto tried ; while the pollen of the typha, according to Braconnot, dissolves without decomposition in concentrated acids ; and those of *Lilium bulbiferum* and *candidum* have the same property, according to Herepath. The only pollen having this property, which I examined, was that of the holly. I have never been able to detect the slightest trace of starch in pollen, which agrees perfectly with the views of Raspail. Sugar, on the contrary, appears to be always present. On the presence of malic acid, which is stated to have been found in the pollen of the date by Fourcroy, and in that of the cedar by Macaire Prinsep, I cannot decide; at least I have not been able to detect its presence in any of the pollens which I have examined. Sulphur does not appear to be a constant constituent, although I have found it present as sulphate in most of the pollens which I examined, which agrees with the analysis of the pollen of the cedar by Macaire Prinsep.‡ Phosphorus, on the other hand, appears to play an important part in the function of pollens ; I am inclined to think it exists, not only as phosphoric acid, but also as phosphorus in combination with organic matter, in some pollens. The quantity of phosphoric acid yielded by the ash of most pollens exceeds 40 per cent.

---

* *Annal. des Sciences d'Obs.*, tom. iii. p. 338. 1830.

† Quarterly Journal of the Chemical Society, No. i. p. 1.

‡ *Bibliotheque Universelle,* 1830, l. 5.

"Silica appears to be always present, and sometimes in considerable quantity. The proportion of magnesia and of alkalies is also remarkable.

"Whether pollenine is a homogeneous substance, or not, remains yet to be decided. The analyses hitherto made, as well as my own, give very varying results. The difficulty of obtaining sufficient material has hitherto prevented me from endeavouring to effect a separation of the tissues which usually compose the grain of pollen, but I hope in a short time to arrive at some results on this point. I have, however, been able to settle one point, that is, the existence of nitrogen. In every pollen which I have hitherto examined I have found that substance, and generally in very large proportion, in some cases 8 and 9, and in another 11 per cent.

"I have examined the products of the action of nitric acid on the pollenine, and have arrived at some very remarkable results which, when completed, will, I hope, throw considerable light on the nature of that body.

"When pollenine from the pollen of *Pinus picea* is treated with nitric acid of sp. gr. 1·25, in a retort to which is attached an apparatus for condensing, kept extremely cool, and gently heated, a violent action takes place, and after some time the whole of the pollen disappears, the surface of the liquid in the retort becomes covered with a considerable layer of oil. If the distillation be continued for some time, a quantity of oil will distil over, a portion of which will float in the liquid in the receiver, while a considerable portion will be found in solution. The oil which distils over consists principally of butyric, valerianic, and the other volatile acids derived from the action of nitric acid on fats. I have not as yet sufficiently examined the fatty body which forms on the surface of the liquid in the retort. It is perfectly white, soft, and fuses at a very low temperature, forming a perfectly colourless oil having an extremely aromatic smell, and decomposing when strongly heated. By continuing the action of nitric acid upon it, it entirely breaks up into suberic acid, valerianic acid, veleronnitrile, and some other products. During the oxidation of the pollen, abundance of hydrocyanic acid is given off, indeed in such quantity as to mask the smell of every other body. This is an additional proof of the presence of nitrogen.

" When the solid fat is removed from the retort, and the remaining liquid distilled nearly to dryness until all the volatile oily acids have passed over, there remains in the retort a large quantity of suberic acid, and also pimelic, and the other acids obtained in the oxidation of fat, but the principal product is suberic acid. I obtained oxalic acid only from one pollen, namely, *Crataegus monogyna.*

" It would be premature to speak of the nature of the white solid fat, but I may state that I think I will be able to establish its relation to wax on one side, and to lignine and starch on the other.

" There is one point more, of great interest, to which I would beg to call the attention of botanists. Wydeler, as a consequence of the theory of Schleiden, maintains that plants have not two sexes, as hitherto supposed; that the anther, far from being the male organ, is the female,—in fact, an ovary; that the pollen grain is the germ of a new plant; that the pollinic tube becomes the embryo within the embryo sac of the ovule, which merely supplies nourishment and shelter to the embryo up to a certain period; and that this phenomena is improperly termed ' fecundation.'* I think the chemical nature of the pollen of *Lycopodium clavatum*, which is a true germ or sporule, bears out this view in full. I have obtained all the products from that body which I have obtained from the pollen of the *Pinus picea*, &c.

" I hoped to have been able to have arrived at some further conclusions this Spring, but want of time, and the badness of the season, prevented me from obtaining pollen in any quantity; indeed it is not very easy to obtain it at any time. However, I hope to be able to add something more important, particularly with reference to the nature of wax and its connexion with pollen, at the next meeting of the Academy."

---

* Wilson in Hooker's Journal, t. xxiv. 92

The President made a short communication on the relation of the Variations of the Magnetic Elements (diurnal and annual) to the contemporaneous Variations of Temperature.

Having already shown* that the changes of the magnetic declination, and those of temperature, were connected in the most intimate manner, the author was naturally led to expect a similar correspondence in the case of the other magnetic elements. This expectation has been fully confirmed, so far as relates to the intensity of the horizontal component of the magnetic force. Upon a comparison of the results of observation of this element for the four years (1840–1843) already discussed, he has found that the diurnal range of the intensity (or the area of the diurnal curve, which observes a similar law) undergoes a change in the course of the year analogous to that which has been already found in the case of the declination, and, therefore, like it, closely resembling the corresponding variation of the range of temperature. The minimum range of the intensity (like that of the declination and temperature) occurs in December. There are two maxima, with a small intervening minimum; the first of these occurs (as in the case of the declination) in April, and the second in July.

The mean diurnal ranges of the intensity, in the separate years, likewise follow a progression similar to that of the temperature, being greatest in the first of the four years above mentioned, and diminishing thence unto the last.

The *annual variation* of the horizontal intensity is, in like manner, closely connected with the corresponding variation of

---

* *Results of Observations made at the Magnetical Observatory of Dublin.* (First Series.) Trans. R. I. A., vol. xxii. part i.